

REMARKS

Reconsideration and withdrawal of the final rejection with respect to all of the claims now pending in the application, (i.e., Claims 1, 3-10, and 17-18) are respectfully requested in view of the foregoing amendments and the following remarks.

Initially, Applicant respectfully disagrees that Applicant's previous amendment necessitated the new grounds of rejection making this action final. No claim amendments were made in Applicant's previous reply, nor was an Information Disclosure Statement submitted. Therefore, the Examiner's introduction of a new ground of rejection was not necessitated by any action by Applicant and, pursuant to MPEP §706.07(a), the finality of the rejection was therefore improper. Accordingly, reconsideration and withdrawal of the finality of the last action are respectfully requested.

It should be noted that, at the heart of Applicant's invention is the provision of a neutron generator for tumor treatment. The application discloses two embodiments, both of which have common components - namely, a high current electron bombardment ion source and means for generating an electron beam. The following narrative of the invention has support in the specification beginning in the last paragraph on page 11 through the end of page 12. The beam enters a gas-filled ionization chamber and creates ions through collisions between the electron beam and

the gas. This chamber is defined by having a repeller on one end and an anode with an ion exit slit on the other. The repeller is provided with a higher positive potential than the anode, thereby driving the ion beam towards the anode and ultimately extracting the ion beam out of the exit slit. The exit slit is equal to or greater than 3 mm which is considerably wider than standard electron bombardment sources of the prior art. After exiting the ionization chamber, the beam passes between two focus plates defining a focusing aperture, provided with a yet lower positive potential than the anode of the ionization chamber. The ion beam is further accelerated due to this potential difference. The focusing aperture further operates as a steering means by varying the potential between the two steering plates. The focusing aperture is also equal to or greater than 3 mm.

The ion beam is further accelerated out of the ion source towards a hollow needle. This is accomplished by providing the needle with a negative potential from a high voltage feedthrough. The needle would be insulated for the patient's safety. Inside the needle there is mounted a reaction target at the far end. This end is brought in close proximity to the patient with a tumor. The far end of the needle is also sealed to retain a vacuum. The bombardment of the target by the ions create neutrons for tumor treatment.

In the second embodiment, the needle is kept at ground potential (where it does not require insulation) and the electron bombardment ion source may be provided with

a highly positive potential by means of the high voltage feed through. This will create a similar acceleration process as in the previous embodiment. Support for this embodiment may be found in the specification at page 14, lines 9-11.

By this Amendment, Claim 2 was cancelled and the subject matter of Claim 2 was incorporated into Claim 1. Claim 1 was further amended to include a repeller, and an anode defining an exit slit, in the gas-filled acceleration stage, support for which can be found at page 12, lines 2-4. The hollow needle of claim 2 was incorporated into claim 1 and the occluded reaction target of claim 1 is mounted substantially at the end of the hollow needle and the neutron generator is now defined as being used for tumor treatment.

New claim 17 defines further features of the first embodiment described in the preceding discussion, support for which can be found in the specification at page 16, lines 1-16. New claim 18 defines further features of the second embodiment as previously discussed, support for which can be found at page 14, lines 9-11 of the specification.

The rejection of claims 1-8, and 10 under 35 U.S.C. 102(b) as being anticipated by Miller, U.S. Patent No. 3,816,785 is respectfully traversed. Applicant's invention is directed to a neutron generator that comprises, *inter alia*, a high voltage acceleration stage for accelerating ions into a hollow needle towards a target mounted within the far end of said needle. Applicant has a separate acceleration stage between the ion source and the needle, distinct from the focusing and steering aperture, as claimed in

Claim 1. In contrast, Miller has a combined acceleration and steering means, 20-22. Miller also does not have a needle for coming into close proximity of a patient for tumor treatment, as now claimed in Claim 1. Further, Miller's target capsule needle is exposed to the ion beam at the front of his gas-filled target capsule where neutron production occurs. For neutron brachytherapy (tumor treatment), neutron production must occur at a target tip to be brought into close proximity with the tumor. Applicant's invention as set forth in amended Claim 1 includes a hollow needle where the ion bombardment reaction occurs on a target mounted within said hollow needle substantially towards the end of said needle so it may be brought into contact with the tumor. It is important to also note that Claim 1 also requires the exit slit of the ion source to be at least 3mm in width. Figure 3 shows that opening the apertures from 1 mm to 3 mm increases the output by a factor of 3. This greater output is required for tumor treatment.

Furthermore, it is Applicant's belief that Miller is simply a "paper" patent and that the Miller Fig. 1 device has never been built nor is it capable of the neutron production rate necessary for tumor treatment. The invention claimed by applicant allows much higher neutron production which is necessary for such treatment.

Finally, Applicant hereby requests a two-month extension of time to respond to the outstanding Office Action. A PTO-2038 form in the amount of \$210.00 is enclosed herewith for the official fee associated therewith. In the event of any

deficiency for the required amount for an extension of time, please debit Deposit Account No. 07-0130.

In view of the foregoing arguments and amendments, it is believed that all pending claims in the application, (i.e., Claims 1, 3-10, and 17-18), are allowable over the cited prior art and reconsideration and withdrawal of the final rejection and allowance of the claims at an early stage are earnestly solicited. At the very minimum, reconsideration and withdrawal of the finality of the former Office Action is earnestly solicited.

Respectfully submitted,

LEON FORMAN



Thomas M. Galgano, (27,638)
GALGANO & BURKE, LLP
Attorneys for Applicant
300 Rabro Drive, Suite 135
Hauppauge, NY 11788
(631) 582-6161

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I hereby certify that this correspondence is being deposited with the United States Postal Service as first-class mail in an envelope addressed to: Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on January 20, 2004

By: 

Thomas M. Galgano, Esq.

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